Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend claims 1, 13, 16, 23, 26, and 27, as follows:

Listing of Claims:

1. (Currently amended) A method for calculating output sample values from input graphics data having corresponding input sample values, the method comprising:

calculating from a sample set of input graphics data an angular frequency value ω for a sine-wave model and determining whether the frequency value ω is in a frequency range;

where the frequency value ω is in the range, determining from the sample set a first model from which output sample values are calculated;

where the frequency value ω is out of the range ~~otherwise~~, determining from the sample set a second model from which output sample values are calculated; and

calculating output sample values from the resulting model.

2. (Original) The method of claim 1 wherein the second model comprises a non-sinusoidal transition model.

3. (Original) The method of claim 1 wherein the second model comprises a cubic transition model between two of the input samples.

4. (Original) The method of claim 1 wherein the frequency range comprises $\arccos(-0.95) \leq \omega < \arccos(0.9)$.

5. (Original) The method of claim 1 wherein the sample set includes first, second, third, fourth, and fifth input samples and the respective input sample values, and calculating the angular frequency value ω comprises calculating the frequency value ω as:

$$\omega = \arccos\left(\frac{\left(\frac{d_1}{d_2}-1\right)}{2}\right),$$

where $d_1 = (V_{-1} - V_2)$ and $d_2 = (V_0 - V_1)$ if $|V_0 - V_1| > |V_{-1} - V_0|$,

otherwise $d_1 = (V_{-2} - V_1)$ and $d_2 = (V_{-1} - V_0)$,

where V_{-2}, V_{-1}, V_0, V_1, and V_2, are the first, second, third, fourth, and fifth values, respectively.

6. (Original) The method of claim 5 wherein the first model comprises a sine-wave model and the output sample values are calculated from the equation:

$$V_p = A\sin(\omega p + \phi) + B,$$

where V_p is the output sample value at position p, ω is the angular frequency,

$B = V_0 - ASIN$,

$\phi = \arctan 2(ASIN, ACOS)$, and

$A = \sqrt{(ASIN)^2 + (ACOS)^2}$,

where $ACOS = \dfrac{V_1 - V_{-1}}{2\sin(\omega)}$ and $ASIN = \dfrac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$.

7. (Original) The method of claim 5 wherein the first model comprises a sine-wave model and the output sample values are calculated from the equation:

$$R_p = A\sin(\phi)\cos(\omega p) + A\cos(\phi)\sin(\omega p) + B,$$

where R_p is the output sample value at position p, ω is the angular frequency,

$B = V_0 - ASIN$,

$A\cos(\phi) = \dfrac{V_1 - V_{-1}}{2\sin(\omega)}$, and $A\sin(\phi) = ASIN = \dfrac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$.

8. (Original) The method of claim 7, further comprising verifying the accuracy of the sine-wave model calculated from the input samples at the first and fifth input samples.

9. (Original) The method of claim 8 wherein verifying the accuracy of the sine-wave model comprises calculating:

$diff_A = |R_{-2} - V_{-2}|$ and $diff_B = |R_2 - V_2|$; and

confirming that $diff_A$ or $diff_B$ is less than a fraction of A, otherwise, calculating output sample values from the second model.

10. (Original) The method of claim 9 wherein the fraction of A is one-fourth.

11. (Original) The method of claim 9, further comprising estimating A from:

$A \approx s + \frac{c}{2}\ if(s > c)$,

otherwise $A \approx c + \frac{s}{2}$,

where $s = |ASIN|$ and $c = |ACOS|$.

12. (Original) The method of claim 5 wherein the first model comprises a cubic model and the output sample values are calculated from the equation:

$f(\Delta p) = \sum_{i=0}^{3} C_i (\Delta p)^i$,

where $k = V_1 - V_0$, $C_3 = gr_1 + gr_0 - 2k$, $C_2 = k - C_3 - gr_0$, $C_1 = gr_0$, $C_0 = V_0$, and

$gr_p = -A\sin(\phi) \times \omega \sin(\omega p) + A\cos(\phi) \times \omega \cos(\omega p)$,

where gr_p is the gradient value cosited at position p, ω is the angular frequency,

$A\cos(\phi) = ACOS = \frac{V_1 - V_{-1}}{2\sin(\omega)}$, and $A\sin(\phi) = ASIN = \frac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$.

13. (Currently amended) A method for calculating a transition model from input graphics data having corresponding input sample values~~ from which resample values may be calculated~~, the method comprising:

selecting a sample set of input graphics data including first, second, third, fourth, and fifth input samples, V_{-2}, V_{-1}, V_0, V_1, and V_2, respectively;

calculating from the sample set an angular frequency value ω, where

$$\omega = \arccos\left(\frac{\left(\frac{d_1}{d_2} - 1\right)}{2}\right),$$

$d_1 = (V_{-1} - V_2)$ and $d_2 = (V_0 - V_1)$ if $|V_0 - V_1| > |V_{-1} - V_0|$,

otherwise $d_1 = (V_{-2} - V_1)$ and $d_2 = (V_{-1} - V_0)$;

determining whether the frequency value ω is in a frequency range;

where the frequency value ω is in the frequency range, calculating output sample values from the equation:

$$V_p = A\sin(\omega p + \phi) + B,$$

where V_p is the output sample value at position p,

$B = V_0 - ASIN$,

$\phi = \arctan 2(ASIN, ACOS)$, and

$A = \sqrt{(ASIN)^2 + (ACOS)^2}$,

where $ACOS = \dfrac{V_1 - V_{-1}}{2\sin(\omega)}$ and $ASIN = \dfrac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$; and

otherwise, calculating output sample values from a non-sinusoidal transition model derived from the sample set.

14. (Original) The method of claim 13 wherein the non-sinusoidal transition model comprises a cubic transition model between two of the input samples.

15. (Original) The method of claim 13 wherein the frequency range comprises arccos(-0.95) ≤ ω < arccos(0.9).

16. (Currently amended) A method for calculating a transition model from input graphics data having corresponding input sample values~~ from which resample values may be calculated~~, the method comprising:

selecting a sample set of input graphics data including first, second, third, fourth, and fifth input samples, V_{-2}, V_{-1}, V_0, V_1, and V_2, respectively;

calculating from the sample set an angular frequency value ω for a sine-wave model, where

$$\omega = \arccos\left(\frac{\left(\frac{d_1}{d_2}-1\right)}{2}\right),$$

$d_1 = (V_{-1} - V_2)$ and $d_2 = (V_0 - V_1)$ if $|V_0 - V_1| > |V_{-1} - V_0|$,

otherwise $d_1 = (V_{-2} - V_1)$ and $d_2 = (V_{-1} - V_0)$;

determining whether the frequency value ω is in a frequency range;

where the frequency value ω is in the frequency range, calculating output sample values from the equation:

$R_p = A\sin(\phi)\cos(\omega p) + A\cos(\phi)\sin(\omega p) + B$,

where R_p is the output sample value at position p, ω is an angular frequency,

$B = V_0 - ASIN$,

$\phi = \arctan 2(ASIN, ACOS)$, and

$A = \sqrt{(ASIN)^2 + (ACOS)^2}$,

where $A\cos(\phi) = ACOS = \frac{V_1 - V_{-1}}{2\sin(\omega)}$ and $A\sin(\phi) = ASIN = \frac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$; and

otherwise, calculating output sample values from a non-sinusoidal transition model derived from the sample set.

17. (Original) The method of claim 16 wherein the non-sinusoidal transition model comprises a cubic transition model between two of the input samples.

18. (Original) The method of claim 16 wherein the frequency range comprises arccos(-0.95) $\leq \omega <$ arccos(0.9).

19. (Original) The method of claim 16, further comprising verifying the accuracy of the sine-wave model calculated from the input samples at the first and fifth input samples.

20. (Original) The method of claim 19 wherein verifying the accuracy of the sine-wave model comprises calculating:

$diff_A = |R_{-2} - V_{-2}|$ and $diff_B = |R_2 - V_2|$; and

confirming that $diff_A$ or $diff_B$ is less than a fraction of A, otherwise, calculating output sample values from the second model.

21. (Original) The method of claim 20 wherein the fraction of A is one-fourth.

22. (Original) The method of claim 20, further comprising estimating A from:

$A \approx s + \frac{c}{2}\ if(s > c)$,

otherwise $A \approx c + \frac{s}{2}$,

where $s = |ASIN|$ and $c = |ACOS|$.

23. (Currently amended) A method for calculating a transition model from input graphics data having corresponding input sample values~~ from which resample values may be calculated~~, the method comprising:

selecting a sample set of input graphics data including first, second, third, fourth, and fifth input samples, V_{-2}, V_{-1}, V_0, V_1, and V_2, respectively;

calculating from the sample set an angular frequency value ω, where

$$\omega = \arccos\left(\frac{\left(\frac{d_1}{d_2}-1\right)}{2}\right),$$

where $d_1 = (V_{-1} - V_2)$ and $d_2 = (V_0 - V_1)$ if $|V_0 - V_1| > |V_{-1} - V_0|$,

otherwise $d_1 = (V_{-2} - V_1)$ and $d_2 = (V_{-1} - V_0)$;

determining whether the frequency value ω is in a frequency range;

where the frequency value ω is in the range, calculating output sample values from the cubic equation:

$f(\Delta p) = \sum_{i=0}^{3} C_i (\Delta p)^i$,

where $k = V_1 - V_0$, $C_3 = gr_1 + gr_0 - 2k$, $C_2 = k - C_3 - gr_0$, $C_1 = gr_0$, $C_0 = V_0$, and

$gr_p = -A\sin(\phi)\times\omega\sin(\omega p) + A\cos(\phi)\times\omega\cos(\omega p)$,

where gr_p is the gradient value cosited at position p, ω is the angular frequency,

$\phi = \arctan 2(ASIN, ACOS)$, and

$A = \sqrt{(ASIN)^2 + (ACOS)^2}$,

where $A\cos(\phi) = ACOS = \dfrac{V_1 - V_{-1}}{2\sin(\omega)}$ and $A\sin(\phi) = ASIN = \dfrac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$; and

otherwise, calculating output sample values from a non-sinusoidal transition model derived from the sample set.

24. (Original) The method of claim 23 wherein the non-sinusoidal transition model comprises a cubic transition model between two of the input samples.

25. (Original) The method of claim 23 wherein the frequency range comprises arccos(-0.95) ≤ ω < arccos(0.9).

26. (Currently amended) A resampling circuit for providing resample output values calculated from sample values of input pixel samples, the resampling circuit comprising:

a sine-wave model resampling circuit adapted to receive signals representing respective sample values for input pixel samples, the sine-wave model resampling circuit calculating from a sample set of the sample values an angular frequency value ω for a sine-wave model and determining whether the frequency value ω is in a frequency range, and where the frequency value ω is in the frequency range, determining from the sample set a sinusoidal model from which the resample output values are calculated and calculating resample output sample values from the resulting sinusoidal model[[.]]; and

a non-sine-wave model resampling circuit coupled to the sine-wave model resampling circuit to receive the sample values of the sample set when the frequency value ω is outside of the frequency range, the non-sine-wave model resampling circuit determining from the sample set a non-sinusoidal model from which the resample output sample values are calculated and calculating resample output sample values from the resulting non-sinusoidal model.

27. (Currently amended) A resampling circuit adapted to receive signals representing respective sample values for input pixel samples and provide resample output values, the resampling circuit operable to calculate ~~calculating~~ from a sample set of the sample values an angular frequency value ω for a sine-wave model and determine ~~determining~~ whether the frequency value ω is in a frequency range, and where the frequency value ω is in the frequency range, further operable to determine ~~determining~~ from the sample set a sinusoidal model from which the resample output values are calculated and where the angular frequency value ω is not in the frequency range, ~~otherwise,~~ operable to determine ~~determining~~ from the sample set a non-sinusoidal model from which the resample output sample values are calculated, the resampling circuit further operable to calculate ~~calculating~~ resample output sample values from the resulting model.

28. (Original) The resampling circuit of claim 27 wherein the non-sinusoidal model comprises a cubic transition model between two of the input samples.

29. (Original) The resampling circuit of claim 27 wherein the frequency range comprises arccos(-0.95) $\leq \omega <$ arccos(0.9).

30. (Original) The resampling circuit of claim 27 wherein the sample set includes first, second, third, fourth, and fifth input samples and the respective input sample values, and the resampling circuit calculates the angular frequency value ω from:

$$\omega = \arccos\left(\frac{\left(\dfrac{d_1}{d_2} - 1\right)}{2}\right),$$

where $d_1 = (V_{-1} - V_2)$ and $d_2 = (V_0 - V_1)$ if $|V_0 - V_1| > |V_{-1} - V_0|$,

otherwise $d_1 = (V_{-2} - V_1)$ and $d_2 = (V_{-1} - V_0)$,

where V_{-2}, V_{-1}, V_0, V_1, and V_2, are the first, second, third, fourth, and fifth values, respectively.

31. (Original) The resampling circuit of claim 30 wherein the sine-wave model and the output sample values are calculated by the resampling circuit from the equation:

$$V_p = A\sin(\omega p + \phi) + B,$$

where V_p is the output sample value at position p, ω is an angular frequency calculated from the input samples,

$$B = V_0 - ASIN,$$

$$\phi = \arctan 2(ASIN, ACOS), \text{ and}$$

$$A = \sqrt{(ASIN)^2 + (ACOS)^2},$$

where $ACOS = \dfrac{V_1 - V_{-1}}{2\sin(\omega)}$ and $ASIN = \dfrac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$.

32. (Original) The resampling circuit of claim 30 wherein the sine-wave model and the output sample values are calculated by the resampling circuit from the equation:

$$R_p = A\sin(\phi)\cos(\omega p) + A\cos(\phi)\sin(\omega p) + B,$$

where R_p is the output sample value at position p, ω is the angular frequency,

$$B = V_0 - ASIN,$$

$$\phi = \arctan 2(ASIN, ACOS), \text{ and}$$

$$A = \sqrt{(ASIN)^2 + (ACOS)^2},$$

where $A\cos(\phi) = ACOS = \frac{V_1 - V_{-1}}{2\sin(\omega)}$ and $A\sin(\phi) = ASIN = \frac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$.

33. (Original) The resampling circuit of claim 32 further verifying the accuracy of the sine-wave model by calculating:

$diff_A = |R_{-2} - V_{-2}|$ and $diff_B = |R_2 - V_2|$; and

confirming that $diff_A$ or $diff_B$ is less than a fraction of A, otherwise, calculating output sample values from the second model.

34. (Original) The resampling circuit of claim 33 wherein the fraction of A is one-fourth.

35. (Original) The resampling circuit of claim 33 further estimating A from:

$$A \approx s + \frac{c}{2} \; if(s > c),$$

otherwise $A \approx c + \frac{s}{2}$,

where $s = |ASIN|$ and $c = |ACOS|$.

36. (Original) The resampling circuit of claim 27 the sine-wave model and the output sample values are calculated by the resampling circuit from the equation:

$$f(\Delta p) = \sum_{i=0}^{3} C_i (\Delta p)^i,$$

where $k = V_1 - V_0$, $C_3 = gr_1 + gr_0 - 2k$, $C_2 = k - C_3 - gr_0$, $C_1 = gr_0$, $C_0 = V_0$, and

$$gr_p = -A\sin(\phi)\times\omega\sin(\omega p) + A\cos(\phi)\times\omega\cos(\omega p),$$

where gr_p is the gradient value cosited at position p, ω is the angular frequency,

$\phi = \arctan 2(ASIN, ACOS)$, and

$A = \sqrt{(ASIN)^2 + (ACOS)^2}$,

where $A\cos(\phi) = ACOS = \dfrac{V_1 - V_{-1}}{2\sin(\omega)}$ and $A\sin(\phi) = ASIN = \dfrac{V_1 + V_{-1} - 2V_0}{2(\cos(\omega) - 1)}$.